Ownership matrix	**RPP-27195**

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TABLE OF ATTACHMENTS

1.0 PURPOSE AND SCOPE

This procedure provides direction for software development, implementation, and management to all Washington River Protection Solutions, LLC (WRPS) employees, suppliers, and subcontractors for the initiation of the software work activities (SWAs) required from TFC-PLN-02. Applications controlled by existing work processes and outside the scope of TFC-BSM-IRM-STD-01 are not required to comply with this procedure or associated implementing procedures, and shall be managed under other established WRPS programs (e.g., Procurement, Engineering, Measuring & Test Equipment, and Radiological Engineering).

This procedure includes instructions for software evaluation, needs identification, registration and grading, exploration of possible alternatives, alternatives analysis, and retirement activities.

This procedure provides exit points to associated implementing procedures that give specific instruction for SWAs based on criteria established in Section 2.0. The procedure set allows for a traceable and orderly flow of the SWAs and deliverables.

2.0 IMPLEMENTATION

Existing software discovered to not be in compliance with this procedure shall be evaluated. See Section 4.1.

This procedure is implemented in conjunction with the following procedures:

- TFC-ENG-DESIGN-P-12 provides implementation direction for managing SWAs specific to plant installed software associated with a structure, system, or component (SSC) or other productivity and job management tools supporting operations (e.g., plant administrative software). Any organization that manages software that is installed and operational at the facilities managed by WRPS may use this procedure. This definition includes, but is not limited to, distributed control systems (DCS), programmable logic controllers (PLC), human-machine interface (HMI), software, databases, and plant-related computer programs.

- TFC-ENG-DESIGN-C-32 provides implementation direction for managing SWAs specific to utility calculation software. Single-use applications of utility calculation software should follow TFC-ENG-DESIGN-C-10.

- TFC-BSM-IRM_HS-C-03 provides implementation direction for managing SWAs that are not addressed by TFC-ENG-DESIGN-C-32 or TFC-ENG-DESIGN-P-12.

In addition, the WRPS implementation of the Hanford Information Systems Inventory (HISI) status field is below:

- In Development. Software projects currently being developed or procured and not yet approved for Operational status.

- Operational. Currently in production mode and approved for use in accordance with applicable procedures.

- On Standby. Software that was previously in Operational status. Corrective action has been identified and the software is not approved for Operational status. Software remains

in On Standby status until the issue is corrected. Software in On Standby mode is not authorized for use, but a specific and limited software need may consider TFC-BSM-IRM_HS-C-11.

- Retired. Retirement process has been completed, but the software may later be re-qualified and returned to production through an approved Version Description Document (VDD) in accordance with Section 4.5.

- Terminated. Software no longer in use and is an intermediate step to retirement.

- Withdrawn. Software was in development, never operational, and is no longer needed.

3.0 RESPONSIBILITIES

3.1 Software Owners

In HISI, the Software Owner is referred to as Owner Manager, but the Software Owner is not required to be a member of management.

- Have a working knowledge of, and follow, applicable procedures for software life-cycle requirements and authorization.

- Communicate functional direction and guidance to technical support groups for software.

- Maintain general knowledge of property, including its use, custodian assignment, general condition, and location.

- Maintain software life-cycle documents up to date and available for review from conception to retirement.

- Provide adequate physical protection of software physical items (CDs, DVDs, manuals) to prevent loss, damage, or destruction and report such occurrences as required by TFC-BSM-FPM_PR-C-01.

- Ensure that software life-cycle deliverables are compliant with procedures and are available for review.

- Ensure implementation of applicable cyber security requirements.

- Report and work with vendors to correct any errors discovered in the software.

- Act as a single point of contact for interfaces involving the software.

- Responsible for HISI registration accuracy.

- Identify and approve software specifications, acquisition, verification and validation (including inspection and test), configuration management, maintenance, and retirement of an application.

- Ensure SWAs are completed correctly, fully approved, and implemented.

- Complete the initial registration and Software Grading Checklist (SGC) in HISI.
- Serve as the approval authority for the VDD section in HISI.
- Complete training class 356123, Software Quality Assurance.

3.2 Software Project Lead

- Manages writing of life-cycle deliverables and posting of document numbers in HISI.
- Submits the VDD into the approval process.
- Updates HISI sections (e.g., Core, Contacts, Interfaces, Hosts [servers], VDD).
- Completes training class 356123, Software Quality Assurance.

3.3 Software Technical Support Analyst

In HISI, the Software Technical Support Analysts (STSA) fulfills the roles of Business Analyst and Subject Matter Expert (SME).

- Coaches and supports Project Leads in the development of software life-cycle deliverables.
- Assists in completion of HISI entries.
- Ensures adequate independence regarding documentation generation and review.
- Assists in the development of acquisition documents for software.
- Reviews software quality assurance (SQA) plans, standards, and procedures, against the requirements of the Quality Assurance Program Description (QAPD).
- Provides support of the SGC.
- Supports continuing improvement of the software procedures and standards.
- Performs SME reviews/approvals of HISI registrations, updates, and retirements.
- Represents assigned organization as a voting member of the Software Review Board (SRB), according to TFC-CHARTER-47.
- Completes Qualification Card 351172, “Software Technical Support Analyst,” and maintains through Requalification Card 351173.
- Is assigned as a contact for software applications registered in HISI.

3.4 Software User

- Ensures software is registered in HISI.

- Uses software in accordance with its intended function as outlined in the Software Management Plan (SMP).

3.5 Information Resource Management

- Manages and implements the SQA program.
- Provides interface with Mission Support Contractor.
- Provides infrastructure assistance.
- Manages enterprise-wide application strategy.

3.6 Quality Assurance

- Provides oversight and independent assessment of software programs and SQA.
- Serves as the interpretive authority for the SQA source requirements and the QAPD.
- Provides supporting direction in the development of a software quality program.
- Completes training class 356123, Software Quality Assurance.

3.7 Software Review Board

- Comprises STSAs who are appointed by Level 1 managers.

- Provides subject expertise for interpretation and implementation guidance of the DOE O 414.1D, "Quality Assurance," and ASME NQA-1-2008, "Quality Assurance Requirements for Nuclear Facility Applications," including the NQA-1a-2009 addenda requirements as they pertain to software as required by TFC-PLN-02.

- Interprets and advises on Tank Operations Contractor standards and procedures that implement the Order and Standard requirements in accordance with TFC-CHARTER-47.

- Provides reviews and assessments of SWAs or procedures.

- Evaluates software life-cycle deliverables and advises Software Owners and Project Leads.

- Supports determination of applicable controls and documentation requirements for specific software applications, using applicable procedures and documentation requirements in HISI.

3.8 Systems Engineering Control Board

Oversees applications placed on the site network in accordance with MSC-PRO-IS-47277.

3.9 Production Readiness Review Board

Ensures applications, systems, networks, and cyber security requirements are met, properly implemented, and communicated to affected organizations in accordance with MSC-PRO-IS-16677.

3.10 Chief Information Officer

- Serves as the manager, Information Resources Management.
- Chairs the SRB (or delegates).
- Is responsible for the acquisition, inventory management, and security of information technology (IT) resources.
- Provides or delegates Chief Information Officer (CIO) HISI approval requirements.

3.11 Manager

- Assigns the affected role to a qualified employee in the manager's group. See training requirement and Software Ownership responsibilities in Section 3.0.
- May assume an affected role, if qualified, until a qualified replacement is selected.
- Ensures HISI contact information is updated and current.
- Accepts responsibility for and has authority over the information being approved and tasks assigned.

4.0 PROCEDURE
(7.1.1)

A software project may use this procedure for direction in completing appropriate software life-cycle requirements.

As an SME, a qualified STSA shall assist in the performance of this procedure. STSA points of contact for each organization are maintained on the WRPS Chief Information Office > Software Quality Assurance webpage.

HISI role permissions can be found in the HISI User Guide found in the header of the HISI webpage or on the WRPS Chief Information Office > Software Quality Assurance webpage.

Software Owner

1. To evaluate existing software, proceed to Section 4.1.
2. To initiate a new software project, proceed to Section 4.2.
3. To register a software project, proceed to Section 4.3.
4. To complete a Software Inventory Alternatives Analysis, proceed to Section 4.4.
5. To proceed to the appropriate software life-cycle procedure, proceed to Section 4.5.
6. To retire existing software projects, proceed to Section 4.7.

4.1 Existing Software Evaluation

Existing non-safety and non-quality affecting (Grade E, N/A) software applications that have been accepted for use and have the designation of "Operational" status in the HISI that are discovered to be out of compliance with this procedure shall have their deliverables updated as soon as practicable and prior to retirement. Those with a successful history of operation do not require the generation of retroactive documentation but that history shall be documented and shall be accounted for or referenced in the HISI registration.

All safety and quality affecting software in current operation or with an "On Standby" status and not in compliance with the requirements or of this procedure or subordinate procedure shall follow the implementation direction in the following steps.

For questions regarding the implementation, contact the office of the CIO.

Software Owner/STSA/IRM

1. For conditions adverse to the quality of the intended function of the software, complete a Problem Evaluation Request (PER) in accordance with TFC-ESHQ-Q_C-C-01.

    a. Prevent use of the software where applicable.

2. When existing operational software is discovered that has not been registered, register and grade the software in accordance with Section 4.3.

    a. Proceed to step 3.

3. Evaluate risk of operating the software out of compliance with documentation requirements and implementation guidance from the appropriate software procedure.

4. Document any risk associated with continued operation of any software graded A, B, C, or D in the PER, as applicable.

5. For any software with less than adequate assurance it can perform the intended function, change the HISI status to "On Standby."

    a. Proceed to TFC-BSM-IRM_HS-C-11 for any use of the software.

6. Control the software using the appropriate implementing procedure identified in Section 2.0 for the software type and grade level assigned.

4.2 Project Initiation for New Software Proposals

All new software proposals begin at this section in order to identify business drivers and intended use of the proposed software solution. Resources should be allocated to assess implementation alternatives and set up the project.

User/Manager

1. Assign the following roles in the software project, in preparation for registering and grading the software in Section 4.3 and performing the alternatives analysis in Section 4.4:

   - Business process owner associated with the software application development and use
   - Software Owner associated with management of the software and responsibility for applicable SWAs including the Software Life-Cycle Documentation requirements
   - Project lead directly responsible to develop or direct the software project.

2. Complete the software registration and grading in Section 4.3.

4.3 Software Registration and Grading
(7.1.1)

All software identified to perform work associated with the Tank Operations Contract shall be inventoried. To ensure all software is captured, all software within the scope of this procedure shall complete this section following consideration of Section 4.2. The HISI reporting tool is the current tool used to provide inventory entries and modifications into the Integrated Document Management System (IDMS). This process can also be used to register plant installed or other embedded software outside the scope of TFC-BSM-IRM-STD-01 for inventory purposes.

This section must be performed in parallel with Section 4.4 for software alternatives analysis because several HISI entries, including software type and underlying architecture, will not be determined until that analysis is complete.

NOTE: Additional details can be found on the WRPS Chief Information Office > Software Quality Assurance webpage.

Software Owner

1. Register software applications or projects in HISI using the HISI registration form.
2. For Safety Instrumented Systems, exit to TFC-ENG-DESIGN-P-43 (Attachment E).
3. Enter a unique acronym identifier and title to reflect the software being registered.
4. Enter a summary of the software project's purpose, vision, and intended functionality, and a summary of the software project's project scope in the Purpose/Scope field within the HISI registration form.
5. Set the Status field in the registration form to "In Development" for new registrations, as applicable.

   a. If not applicable, select an option consistent with the HISI status definitions in Section 2.0.

6. Add the following required information to the HISI registration form, assigning personnel to reflect the roles and responsibilities in Section 3.0, and contacting the WRPS CIO staff or STSA as needed, to include:

   - Owner Manager (is the Software Owner)
   - Technical Support Manager (can be the Project Lead)
   - Owning Company (Washington River Protection Solutions)
   - Non Hanford? (No)
   - Project Lead
   - Business Categories (select appropriate)
   - Base (Hanford Local Area Network [HLAN] unless not on an HLAN machine)
   - Type (as found in the definitions or contact CIO staff)
   - Uses Database?
   - Breadth of Usage.

7. Submit the registration by clicking on the "Register" button.

Software Owner/STSA/IRM

8. Revise the HISI information and "Update Core Information" as needed by applicable implementing procedures.

9. Complete the SGC section of the HISI entry using guidance provided on the WRPS Chief Information Office > Software Quality Assurance webpage.

   a. Reference Attachment A for process information.

10. Submit the SGC for review by the SRB for concurrence of the software grade, which will begin automatically once you submit a completed SGC.

SRB

11. Review the SGC and approve the software grade utilizing the grading checklist found in HISI, or provide comments to the Software Owner.

STSA

12. During the SGC review, confirm that the Software Owner knows what procedure will govern the management of the software application.

Software Owner

13. Respond to comments and questions from the SRB until the SGC is approved and an approved software grade is assigned.

14. Ensure that at the conclusion of the software registration process and alternatives analysis processes, the following information is known/documented:

    - Software grade level: A, B, C, D, E or N/A
    - Software type.

4.4 Software Alternatives Analysis

An alternatives analysis, also referred to as analysis of alternatives, is conducted to identify any existing applications within the HISI that may meet the user need. If none are found, commercial applications or supplier offerings are identified/evaluated to determine if acquisition is an option, and if acquisition would be a preferred solution to custom development of a solution.

This section must be performed in parallel with Section 4.3 for software registration and grading because the analysis must be based on the software grade derived from completing the SGC completed in Section 4.3 step 9.

Consideration should be given to software dedication requirements for any acquired software performing a safety function as defined in the facility-specific Documented Safety Analysis (DSA) that is not procured from a vendor on the appropriate Evaluated Supplier List as governed by TFC-ENG-DESIGN-C-65. In addition, selection and use of software as a service (SaaS) as an implementation must be evaluated commensurate with the risks associated with sustaining ongoing assurance that the software is operated and maintained under configuration management. Requirements and required actions will be defined in the SMP for the new software application. Criteria to be considered for SaaS are included in the Alternatives Analysis Report template.

Documentation of the alternatives analysis is required for all Safety Software (Grades A-C) and Non-Safety Quality Affecting Software (Grade D) and may utilize the Alternatives Analysis Report template available on the CIO Software Quality Assurance Templates webpage (under "Other Templates").

Software Owner

1. Review existing software applications in HISI to determine if a software application has already been developed to perform the intended function(s).

    a. If no software application exists to perform the intended function(s), document the results of the review in the Alternatives Analysis Report.

        1) Proceed to step 2 to search for alternatives.

    b. If a software application exists in HISI that performs the intended function(s), contact the registered Software Owner to determine if the approved use is the same as the intended use.

        1) If the intended use is adequate, work with the owner and CIO staff to validate licensing requirements and acquire the software.

2) Withdraw the HISI entry and exit to the governing SMP for the selected software.

c. If the existing software application is determined to have a different intended function than the need, control the existing software application as a new application with its own registration and documentation.

d. Document the evaluation in the Alternatives Analysis Report and return to Section 4.3.

2. If no existing software application is registered in HISI, perform a search for software to meet the intended function. Sources may include:

- Academia
- National laboratories
- Other U.S. Department of Energy (DOE) sites
- Office of Scientific and Technical Information
- DOE Central Registry Toolbox Codes
- Commercial software suppliers
- Software service providers (for custom developed software and SaaS).

NOTE: Elements to be included in the analysis are detailed in the Alternatives Analysis Report templates and include a description of the following as appropriate:

- The intended system functions, requirements, and constraints
- Viable alternatives, related assumptions, dependencies, risks, and efforts to utilize each alternative
- Alternatives ranking and selection description
- Cost justification and return on investment
- Intended utilization and consideration for multiple applications, e.g. a spreadsheet utilizing an acquired add-in, etc.
- Methods to address required SWAs when integrating different software types (e.g., addressing procurement of an acquired functionality in a custom developed solution).

3. If candidate software or suppliers are found, document the candidates in the Alternative Analysis Report.

   a. Complete the analysis as structured in the template to decide whether to procure or develop new custom software.

Project Lead

4. Control the Alternatives Analysis Report in a project folder in SharePoint, IDMS, SmartPlant® Foundation (SPF), or similar.

5. Submit the Alternatives Analysis Report for appropriate review and approval such as through review and approval in SPF or TFC-BSM-IRM_AD-C-07.

6. Proceed to Section 4.5.

4.5 Software Selection and Implementation

Following software registration, as detailed in Section 4.3, and alternatives analysis in Section 4.4, the User/Manager shall obtain approval of the selected alternative. The Software Owner shall proceed to the appropriate software procedure based on Section 4.5.

Software Owner or Project Lead

1. Obtain Systems Engineering Control Board (SECB) approval for new acquisitions of systems, equipment, software, cloud-based services, and pilot demonstrations of software.

   a. Submit the electronic SECB Submittal Form, found at http://hlansp.rl.gov/boards/secb2/SitePages/Home.aspx, to the SECB in accordance with MSC-PRO-IS-47277.

   b. Participate in the SECB review.

   c. Plan for upgrades to versions of approved software to be submitted to the SECB.

2. Obtain management approvals for the project to proceed through TFC-BSM-IRM_AD-C-07 or equivalent.

3. Plan to address procurement quality requirements, where applicable, as addressed in TFC-ESHQ-Q_ADM-C-01.

Software Owner

4. Ensure that the steps in Section 4.3 and 4.4 have been completed and appropriate approvals have been obtained.

5. Based on the assigned software type and the Software Owner's organization code, exit this procedure as follows:

   a. For plant installed software as described in Section 2.0, go to TFC-ENG-DESIGN-P-12.

   b. For Grades E, N/A, and non-plant installed software, proceed to Section 4.6.

   c. For utility calculation software as described in Section 2.0, and Grade A, B, C, or D, go to TFC-ENG-DESIGN-C-32.

   d. For software that does not meet the scope of plant installed software or utility calculation software, as described in Section 2.0 and Grade A, B, C, or D, go to TFC-BSM-IRM_HS-C-03.

4.6 Software Management for Grades E, N/A

This section describes the life-cycle activities and documentation requirements for non-safety, non-quality affecting software. The deliverables of this section can be made directly in HISI as entries in the VDD tab or may be provided in an SMP or other life-cycle document. The Software Owner shall make the determination of the appropriate method based on the complexity of the software application. Complex applications, such as custom developed software, should consider the use of the SMP for the applicable life-cycle deliverables similar to Grade D software and in consult with the STSA and the CIO.

Software Owner or Project Lead/STSA

1. Identify deliverables and applicable work activities referenced in Table 1.

4.6.1 Installation and Acceptance Testing

All test procedures and plans shall specify the following, as applicable:

- Required tests and test sequences
- Required ranges of input parameters
- Identification of stages at which testing is required
- Criteria for establishing test cases
- Requirements for testing logic branches
- Requirements for hardware integration
- Anticipated output values
- Acceptance criteria
- Reports, records, standard formatting, and conventions.

NOTE: The second and third methods listed below will require contracted support from the Hanford Site Information Resource Management (IRM) Service Provider. The WRPS Chief Information Office shall be contacted for support.

Software Owner or Project Lead

1. Identify how and where software is intended to be installed:
   - Local installation on workstation
   - Distributed through Software Distribution
   - Client-server based application
   - SaaS hosted and managed by supplier.
2. Complete the Automated Data Processing Approval form in accordance with TFC-BSM-CP_CPR-C-01.
3. Document and save any ADP numbers and any applicable contract numbers in the Acquisition section of the HISI VDD tab.
4. Request software installation from the IRM office, as applicable.

User conducting testing

5. Execute testing sufficient to state the application works as planned.
   a. If software passes testing, proceed to step 6.
   b. If any errors are found, correct them with the developer.
   c. After corrections are made, retest software.

Software Owner or Project Lead

6. If generating an SMP using an SMP template, issue the SMP as a record in accordance with TFC-ENG-DESIGN-C-25 as an Other Software Document.
   a. Reference any document number(s) in the HISI VDD tab.
7. If generating additional software life-cycle documents (e.g., test results) using the applicable templates, issue the documents as records in accordance with TFC-ENG-DESIGN-C-25 as the applicable SQA document type.
   a. Reference any document number(s) in the HISI VDD tab.

4.6.2 Designation of Operational Status

The HISI entry VDD submission is required if specified by procurement documents or requested by IRM. For example, software developed by the Mission Support Alliance, LLC, or utilizing Software Distribution will require that the VDD be approved in accordance with this section.

The Software Owner, with assistance and guidance provided by IRM, is responsible for appropriately reporting the software status and relevant information in HISI.

Project Lead

1. Verify that the VDD has been completed to provide the required information and that the document citation(s) are correct (in the event that an SMP and other SLC documents were published).
   a. Click “Save” then “Submit” to submit the VDD tab for approval.

Software Owner

2. Review and complete the HISI VDD tab for correctness and completeness.

   a. If correct and complete, approve the HISI VDD tab

      1) Continue to step 3.

   b. If the entry is not correct and complete, contact the Project Lead for corrections before continuing.

Software Owner or Project Lead

3. Input the post implementation data in the VDD tab of HISI.

Project Lead

4. Change HISI status in the Core Section to "Operational," if applicable.

NOTE: The following field is not changed for updates or modifications.

5. For initial installs only, complete the "Operational Date" field in HISI.

6. Operate software according to the SMP or VDD requirements.

4.6.3 Problem Reporting/Corrective Actions

Software User

1. Consult with assigned STSA to determine the appropriate action to correct the software problem.

4.6.4 Updates, Management, and Version Modification Requests

Changes to software can be initiated from several sources, including but not limited to: 1) an identified error, 2) from a user request, or 3) Hanford Site IRM Service Provider updates to the operating environment.

NOTE: The application shall remain in Operational status during the completion of the upgrade or modification if the software will remain in use while the modification is installed.

Software Owner or Project Lead

1. If an update or modification to the operating system or other infrastructure configuration item is received from the Hanford Site IRM Service Provider, evaluate for impact.

   a. If the modification has no operational impact, continue operations.

   b. If the modification has an effect on the performance of the software, return to Section 4.6.1, step 5.

Software Owner or Project Lead/IRM

2. Follow the approved configuration management direction for the software, such as TFC-BSM-IRM_HS-CD-03.1.

3. Ensure testing activities, including in-use testing, consider the requirements and content such as specified in TFC-BSM-IRM_HS-C-03.

4.7 Software Retirement

During retirement, support for a software product is terminated and use of the software is prevented. Data preservation requirements may be specified in a retirement plan or checklist.

Software Owner

1. Determine if the software is obsolete or is no longer needed by any applicable WRPS or Hanford Site user during the operations phase of the software life cycle controlled by the governing implementing procedure that was invoked in Section 4.5.

2. Notify all users (either supplying or receiving data) of the intent to retire the software.

   a. Provide a time frame for deactivation to allow users to make necessary changes.

3. Ensure the use of the application has been prevented.

4. Change the Status window in HISI to "Terminated."

5. Ensure any outstanding corrective actions related to the software or use of the software are dispositioned before proceeding with retirement.

6. Based on the type of software grade:

   a. Proceed to Section 4.7.1 for retirement of Safety and Quality Affecting Software (Grades A-D).

   b. Proceed to Section 4.7.2 for retirement of Grade E and N/A software.

4.7.1 Retirement of Safety and Quality Affecting Software (Grades A-D)

Software Owner

1. Verify that all outstanding corrective actions associated with the software have been resolved.

2. Gather and assemble a retirement package identifying the software baseline and all other components of the system, including, but not limited to, the areas listed below and in accordance with a retirement checklist:

   - Operating system
   - Hardware platforms
   - Baseline software products
   - System documentation
   - Project files and data
   - Print drivers

- Report scripts
- Metadata
- Other supporting documentation, as applicable.

NOTE: Retirement includes the requirement for data retrieval in its native format once the system has been archived and removed from production (data preservation) and any media refresh requirements. The Hanford Site IRM Service Provider offers assistance in determining the appropriate method of preservation.

3. Convert, if applicable, and preserve data in a manner that provides for retrieval in its native format.

4. Disposition software completely to ensure all links to software use have been addressed, including:

   a. Remove software from Software Distribution if available, so that no further download installations are possible.

   b. Terminate software license and maintenance agreements through the contracts organization.

   c. Disable or remove software from servers and user workstations.

   d. For commercial off-the-shelf (COTS) applications, depending on the type of products and licensing agreements, recycle COTS software in accordance with TFC-BSM-IRM_HS-C-07 for excess or redeployment.

5. Disposition software configurations as applicable:

   a. Delete or reallocate e-mail mailbox associations with the system.

   b. Remove references to Hanford Site Forms, SPF-generated forms, and references to intranet websites from the system.

   c. Remove any site forms from Site Form distribution.

   d. Change or delete system references embedded in procedures.

   e. Review, revise, or delete production schedules depending on the system.

   f. Cancel any applicable documents in SPF in accordance with TFC-ENG-DESIGN-C-25.

6. Disposition retirement package in accordance with record requirements in TFC-BSM-IRM_DC-C-02.

7. Go to Section 4.7.3 to complete the retirement process.

4.7.2 Retirement of Grade E and N/A Software

Software Owner

1. Verify that all outstanding corrective actions associated with the software have been resolved.

2. In the HISI registration (Comments window of the Core section), provide the date and reason for retirement of the application.

Software Owner/IRM

3. Notify users of application retirement and ensure the software has been removed from user computers.

4. Work with IRM, as applicable, to disposition any disks, servers, hardware, vendor-supplied documents, or other applicable areas.

Software Owner

5. Change status to Retired and exit this procedure.

4.7.3 HISI Approval of Retirement

Software Owner or Project Lead

1. Issue Software Retirement Plan (and/or SMP) in accordance with TFC-ENG-DESIGN-C-25, as applicable.

2. Ensure the Software Retirement Plan has been executed.

   a. If it has been determined that the software application is no longer needed and will be retired, contact WRPS Information Resources Management if you need administrative rights to delete the application.

3. Update the HISI Core Information to indicate “Retired” status.

4. To submit for approval to the HISI contacts, proceed to step 5.

   a. Otherwise, exit the procedure.

5. Update the HISI VDD tab with a reference to the Software Retirement Plan and/or SMP in the Retirement Plan section of the VDD.

6. Select “Submit” on the HISI VDD tab to initiate the automated VDD approval process to approve the final software version for retirement.

Software Owner

7. Review and complete the HISI VDD tab process for correctness and completeness.

   a. If the entry is approved, indicate approval on the HISI VDD tab.

      1) Continue with step 8.

b. If the entry is not approved, contact the Project Lead for corrections.

1) Return to step 5.

8. Ensure the final software baseline and documentation references have been captured in accordance with the Software Configuration Management Plan (SCMP) section of the SMP (or note where in the SMP it is referenced) and TFC-BSM-IRM-STD-02.

Manager

9. Assign a person to retire the software in accordance with the Software Retirement Plan and SMP, as applicable.

Software Owner

10. Notify all users (either supplying or receiving data) of the software disposition.

a. Provide a time frame and actual date for deactivation to allow users to make necessary changes.

11. Enter a post-retirement summary into the "Post-Implementation Information" field on the HISI VDD tab to include the retirement date and a summary description of retirement activities and successes or issues as appropriate.

5.0 DEFINITIONS

Acquired software. Software supplied through basic procurements, two-party agreements, or other contractual arrangements. Acquired software includes COTS software, such as operating systems, database management systems, compilers, software development tools, cyber security applications, and commercial calculation software and spreadsheet tools (e.g., PTCs MathCad and Microsoft's Excel). Downloadable software that is available at no cost to the user (referred to as freeware) is also considered acquired software. Firmware is acquired software and is generally provided by a hardware supplier through the procurement process and cannot be modified after receipt.

Alternatives analysis. An evaluation of different choices available for achieving an objective, usually requiring cost-benefit analysis, life-cycle costing, and sensitivity analysis.

Baseline. A specification or product that has been formally reviewed and agreed upon, that thereafter serves as the basis for use and further development, and that can be changed only by using an approved change control process.

Commercial design and analysis software. A software that is used in conjunction with design and analysis services provided to DOE from a commercial contractor. An example would be where DOE or a management and operating contractor contracts for specified design services support. The design service provider uses its independently developed or acquired software without DOE involvement or support. DOE then receives a completed design. Procurement contracts can be enhanced to require that the software used in the design or analysis services meet the requirements in DOE O 414.1D.

Commercial off-the-shelf (COTS) software. Software defined by a market-driven need, commercially available, and whose fitness for use has been demonstrated by a broad spectrum of commercial users.

Configurable software. Commercially available software or firmware that allows the user to modify the structure and functioning of the software in a limited way to suit user needs.

Configuration item (CI). A collection of hardware or software elements treated as a unit for the purpose of configuration control.

Custom developed software. Software built specifically for a DOE application or to support the same function for a related government organization. It may be developed by DOE, or one of its management and operating contractors, or contracted with a qualified software company through the procurement process.

Deliverable. Any tangible item that results from a project function, activity, or task. Examples of deliverables include process descriptions, plans, procedures, computer programs, and associated documentation.

Error. A condition deviating from an established baseline, including deviations from the current approved computer program and its baseline requirements.

Firmware. The combination of a hardware device, computer programs, and data that reside as read-only software on that device.

Graded approach. The process of ensuring that the level of analyses, documentation, and actions used to comply with requirements are commensurate with a) the relative importance to safety, safeguards, and security; b) the magnitude of any hazard involved; c) the life-cycle stage of a facility or item; d) the programmatic mission of a facility; e) the particular characteristics of a facility or item; f) the relative importance to radiological and non-radiological hazards; and g) any other relevant factors.

Hanford Information Systems Inventory (HISI). A site-wide database used to identify, document, and maintain safety software inventory in accordance with DOE O 414.1D (Attachment 4).

Hazard controls. Measures to eliminate, limit, or mitigate hazards to workers, the public, or the environment, including 1) physical, design, structural, and engineering features; 2) safety structures, systems, and components; 3) safety management programs; 4) Technical Safety Requirements; and 5) other controls necessary to provide adequate protection from hazards.

Plant installed software. Any software, application, database, or computer program that is developed, procured, or maintained, to support an SSC, or other productivity and job management tools supporting operations as defined in TFC-ENG-DESIGN-P-12. This can include acquired, configurable, or custom developed software types.

Problem. Any anomaly perceived to not be functioning properly or as expected.

Problem Evaluation Request (PER). The approved corrective action management system for WRPS.

Project folder. A central repository of material pertinent to a project. Contents typically include deliverables, memos, plans, technical reports, and related items.

Quality Affecting. Activities affecting quality include siting, designing, procuring, fabricating, handling, shipping, receiving, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, modifying, and decommissioning.

Safety function. The performance of an item or service necessary to achieve safe, reliable, and effective utilization of nuclear energy and nuclear material processing.

Safety software. Includes safety system software, safety and hazard analysis software and design software, and safety management and administrative control software.

Software. Computer programs and associated documentation and data pertaining to the operation of a computer system.

Software as a service (SaaS). Software that is owned, delivered, and managed remotely by one or more providers and deployed over the internet. The provider delivers software based on one set of common code and data definitions that is consumed in a one-to-many model by all contracted customers at any time on a pay-for-use basis or as a subscription based on use metrics.

Software Configuration Management (SCM). The process of identifying and defining the configuration items in a system (i.e., software and hardware), controlling the release and change of these items throughout the system's life cycle, and recording and reporting the status of configuration items and change requests.

Software engineering methodology. (a) The application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, the application of engineering to software; and (b) the study of approaches as in (a).

Software life cycle. The activities that comprise the evolution of software from conception to retirement. The software life cycle typically includes the software development cycle and the activities associated with operation, maintenance, and retirement.

Software project. A software or grouping of software with a singular purpose and scope for registration and status accounting in HISI (e.g., a single registration for COTS software application with multiple spreadsheets as configuration items). Note the clarification of new versus existing:

- New. The software will begin with an "In Development" status
- Existing. The Status of "In Development" is not applicable.

Software quality assurance (SQA). 1) A planned and systematic pattern of all actions necessary to provide adequate confidence that an item or product conforms to established technical requirements. 2) A set of activities designed to evaluate the process by which products are developed or manufactured.

Software retirement. Retirement of an application when no longer required, use is prevented, any associated corrective actions are resolved, information is preserved, and any future need for use of the software will require re-qualification as a new software project.

Software safety. The application of the disciplines of system safety engineering techniques throughout the software life cycle to ensure that the software takes positive measures to enhance system safety and that errors that could reduce system safety have been eliminated or controlled to an acceptable level of risk.

Software type. Defined software types relating to applicable software work activities:

- Acquired software
- Custom developed software
- Utility calculation software
- Configurable software
- Commercial design and analysis software.

Support software. Support software includes software tools and system software. As appropriate, the software engineering method and/or software acquisition methods shall establish the need for software tools. The support software may be included and qualified as part of another HISI registration or registered separately, as appropriate.

Toolbox codes. Toolbox codes represent a small number of standard computer models or codes supporting DOE safety analyses. Additional information regarding the toolbox codes can be found in the Central Registry portion of the DOE Office of Health, Safety and Security web page.

Utility calculation software. Software that typically uses commercial off-the-shelf spreadsheet applications as a foundation and user-developed algorithms or data structures to create simple software products. The utility calculation software within the scope of this document is used frequently to perform calculations associated with the design of a system SSC. Utility software that is used with high frequency may be labeled as custom software and may justify the same safety software quality assurance work activities as custom developed software. With utility calculation software, it is important to recognize the difference between quality assurance of the algorithms, macros, and logic that perform the calculations versus quality assurance of the commercial off-the-shelf software itself. Utility calculation software includes the associated data sets, configuration information, and test cases for validation and/or calibration.

6.0 RECORDS

The following records may be generated during the performance of this procedure:

- HISI registration for the application.
- Alternatives Analysis Report
- Electronic SECB form
- Retirement package (when created at end of software life cycle).

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.

7.0 SOURCES

7.1 Requirements

7.1.1 TFC-PLN-02, “Quality Assurance Program Description.”

7.2 References

7.2.1 ASME NQA-1-2008, "Quality Assurance Requirements for Nuclear Facility Applications."

7.2.2 ASME NQA-1a-2009, "Addenda to ASME NQA-1-2008, Quality Assurance Requirements for Nuclear Facility applications."

7.2.3 DOE G 414.1-4, "Safety Software Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements."

7.2.4 DOE O 414.1D, "Quality Assurance."

7.2.5 DOE Policy 450.4A, "Integrated Safety Management Policy."

7.2.6 IEEE Standard 610.12-1990, "Glossary of Software Engineering Terminology."

7.2.7 IEEE Standard 1062a-1998, "Recommended Practice for Software Acquisition."

7.2.8 MSC-PRO-IS-16677, "Production Readiness Review Board."

7.2.9 MSC-PRO-IS-47277, "Systems Engineering Control Board."

7.2.10 TFC-BSM-CP_CPR-C-01, "Purchasing Card (P-Card)."

7.2.11 TFC-BSM-FPM_PR-C-01, "Property Management."

7.2.12 TFC-BSM-IRM_DC-C-02, "Records Management."

7.2.13 TFC-BSM-IRM_HS-C-03, "Software Management."

7.2.14 TFC-BSM-IRM_HS-C-07, "Software Accountability."

7.2.15 TFC-BSM-IRM_HS-C-11, "Administrative Controls for Software on Standby."

7.2.16 TFC-BSM-IRM-STD-01, "Software Life Cycle Standard."

7.2.17 TFC-BSM-IRM-STD-02, "Software Configuration Management Standard."

7.2.18 TFC-CHARTER-47, "Software Review Board."

7.2.19 TFC-ENG-DESIGN-C-25, "Technical Document Control."

7.2.20 TFC-ENG-DESIGN-C-32, "Utility Calculation Software Management."

7.2.21 TFC-ENG-DESIGN-P-12, "Plant Installed Software."

7.2.22 TFC-ESHQ-Q_ADM-C-01, "Graded Quality Assurance."

7.2.23 TFC-ESHQ-Q_C-C-01, "Problem Evaluation Request."

Table 1. Software Compliance Matrix.

Software Life Cycle		Implementation Level (by Software Type and Software Grade Level)			Deliverables	
Phase	Software Work Activity (SWA)	Custom Developed	Configurable	Acquired	Software Management Plan (SMP)	
		E or N/A	E or N/A	E or N/A	Section	Heading
Planning	Software Project Management and Quality Planning[1]	Optional[2]	Optional	Optional	1.0	Introduction
					1.1	Purpose
					1.2	Scope
					1.3	Software Engineering Method
					1.4	Access Controls
					1.5	Project Organization
					1.6	Schedule and Budget Summary
					1.7	Roles and Responsibilities
					1.8	Software Tools
					1.9	Applicable SQA Work Activities and Deliverables
					1.10	Software Verification and Validation Plan
					1.12	Records Management
					1.13	Definitions
					2.10	Retirement Plan/Checklist
					2.3	Alternatives Analysis
	Training of Personnel in the Design, Development, Use, and Evaluation of Safety Software				1.11	Training
	Software Risk Management				2.4	Risk Management
	Software Configuration Management				2.6	Software Configuration Management Plan
	Procurement and Supplier Management	Optional	Graded	Graded	2.11	Acquisition
Requirements	Requirements Identification and Management	Optional	Optional	Optional	2.1	Functional Requirements Definition
					2.7	Software Requirements Specification
					2.2	Requirements Traceability Matrix
					2.14	Technical and Peer Reviews
	Software Safety	N/A	N/A	N/A	2.8	Software Safety Plan
Design and Implementation	Software Design and Implementation	Optional	Optional	N/A	2.12	Software Design Description
	Software Verification and Validation	Optional	N/A	N/A	2.14	Technical and Peer Reviews (code walkthroughs)
			N/A	N/A	2.13	Unit Testing
Test	Software Project Management and Quality Planning	Optional	Optional	Optional	2.15	Software Installation Plan
	Software Verification and Validation				2.13	System Testing
					2.9	Acceptance Test Plan
					2.19	Acceptance Test Report
Operations and Maintenance	Training of Personnel in the Design, Development, Use, and Evaluation of Safety Software	N/A	N/A	N/A	2.16	User Qualification
		Optional	Optional	Optional	2.17	User Training
					2.18	User Documents
	Software Project Management and Quality Planning				2.5	Contingency Plan
					2.6	Software Configuration Management (Change Control)
	Problem Reporting and Corrective Action				2.21	Problem Reporting and Corrective Action
	Software Verification and Validation				2.20	In-Use Tests

[1] Non-SWA requirements such as SECB approval requirements should be included early in planning activities to address potential impacts or authorization restrictions.

[2] Optional activities, when applicable, are treated as Graded activities, as described in TFC-BSM-IRM-STD-01.

ATTACHMENT A - SOFTWARE GRADING CHECKLIST PROCESS OVERVIEW

SGC questions S1 through S3 and all remaining questions implement the graded approach described in TFC-PLN-50 to determine software classification and grade, respectively. The Software Owner is responsible for ensuring correct classification assignment. For most types of software, complete the SGC as follows (instructions for Control System software are listed further down this page).

When filling out the SGC, start with questions S1-S3. If any one of the questions is answered YES, then proceed to Detailed Information questions. If questions S1-S3 are all answered as NO, applicable questions between 1 and 12 except Question 8 will be grayed out and you should proceed to answer available questions between 13 and 19. You will still need to answer question 8 and if Question 8 deals with a Safety function or hazard control function check S3 (Yes) to make the grade a C.

Answer questions E3-E7 to determine any controlled use exemptions.

Answer questions KC and KE to get a determination of Key Critical or Key Essential. These communicate a priority level to the Hanford Site IRM Service Provider in the event of network outages.

Save SGC. Submit SGC. An email will be auto-generated and you will be scheduled to attend a meeting of the SRB. The board will review the SGC for accuracy and concurrence. You will need to be at the meeting to answer any question that might arise concerning use of this software. Once the board approves the SGC, their concurrence will be noted on the bottom portion of the SGC.

For plant installed software applications that support a safety function:

- If the application monitors or controls a DSA-SSC, then answer S1 = ‘Yes’.
- If the application monitors or controls a DSA-SSC which is classified as General Service, then answer S1, S2, S3 = ‘No’, and answer at least one of question 8 and/or 13-17 ‘Yes’.

For all other plant installed software applications:

- S1 is ‘NO’
- If S2 is ‘Yes’, then answer remaining questions
- If S3 is ‘Yes’, then answer remaining questions
- Otherwise, answer remaining questions available.

Save SGC. Submit SGC. An email will be auto-generated and you will be scheduled to attend a meeting of the SRB. The board will review the SGC for accuracy and concurrence. The Software Owner (or a knowledgeable representative) will need to be at the meeting to answer any question that might arise concerning use of this software. Once the board approves the SGC, their concurrence will be noted on the bottom portion of the SGC.